Post Run 3 DAQ Workshop Conclusions

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DAQ Workshop

- The previous DAQ Workshop on January 3-4, 2002 was useful in setting the course for work before Run 3, so we held a two day discussion June 3-4, 2003 to discuss work for Run 4
- Event Builder work was an important issue so Brian flew back from sabbatical in Hungary
- A strategy developed before the meeting confirmed Brian's responsibility for Event Builder development and the resultant performance; the BNL group will help in some areas. The communiqué on the next slide was the result.
- See http://www.phenix.bnl.gov/~phoncs/daqfest/ for presentations and conclusions from the FY02 and FY03 DAQ Workshops

Joint Communiqué

Brian Cole, John Haggerty, Ed O'Brien, Bill Zajc

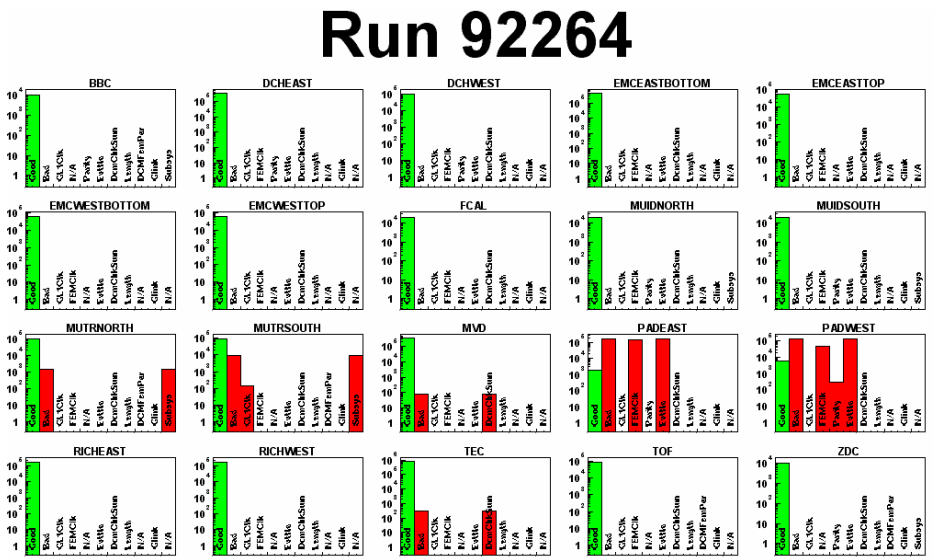
- Between now and September 1, work will proceed by Brian and Nevis students (Michael and TBD) and postdocs (David(s) and Sotiria) with help from the BNL group on:
  - JSEB/SEB interaction (John H.)
  - JSEB firmware (Jack and John H.)
  - Data logging optimization (Martin)
  - Monitoring interface for EvB components (Ed D.)
  - Network management and monitoring (Martin)
  - Purchase Jungo for Linux driver and test performance (John H.)
- If at some point the current performance is found to be a fundamental architectural problem, then Brian will revise it consistent with the experience gained.
- There is a pending decision on alternative paths to developing a Linux based Event Builder. Brian's decision on how to proceed will depend on progress on the current event builder.
- Reminder: Event Builder work will be coordinated by Brian.

Rate and Trigger Expectations

- We assumed that the next run would be a long Au-Au run
- Tony presented rate expectations of rates of 1-5 kHz, with the high end dependent on the storage RF
- We did not discuss the triggering strategy in great detail, but it is clear that being able to log data faster will get a bigger sample of minimum bias events
- Tony has a plausible plan for Level 2 triggers that involve a small number of triggers with modest rejection; the triggering strategy deserves its own workshop, though
- There was excitement/euphoria at the possibility of logging almost all data in Au-Au by a combination of faster logging and compression; a factor of two takes only money, a factor of four will take some work

Multievent Buffering I

- The final test of multievent buffering with the whole detector (runs 92262-92265) still had a problem with the pad chamber, but much progress has been made
- The other systems look at least nominally ok



Multievent Buffering II

- BUT! All the systems need to look for trouble in their own system—it will find you later if don't look now in this data, in test setups, and in standalone runs
- Some problems can be quite subtle—remember only a fraction of events with multievent buffering actually have simultaneous read/write
- Tests were made with the new EMCAL firmware after the run… I saw some results which suggest there is still work to do there, too
- Miljko Bobrek is still on the payroll at Oak Ridge working on these two projects until it is complete
- I would expect that we'll be able to start with three event buffering in all systems in Run 4, and I would propose that we do so unless and until problems are revealed

Event Builder

- Work will proceed over the summer on increasing the rate handling ability of the Event Builder by Brian and Nevis students and postdocs
- The BNL DAQ group will help on several projects as possible
- A new Columbia postdoc is expected to join the Event Builder effort in August or September

Databases

- Objectivity has some problems
  - During the run, it needed a lot of restarts to get rid of excessive locks and accesses from various places (OnCal, RCF, Level 2); the restarts disrupted real database accesses and required expert intervention
  - It has locked us in to gcc 2.95-3… Red Hat 9 comes with 3.2, and 3.3 is out
  - All the other big experiments that adopted it are now in the process of replacing it
  - It's licensed software (religious issue) and fairly expensive (economic issue)
  - Martin is tired of being the only Objectivity "go-to" guy
- Dave Morrison, Tom Hemmick, and Irina Sourikova joined the DAQ meeting to discuss alternatives
- We concluded that Irina should look at the existing databases, starting with offline, to assess the difficulty of switching to a freeware relational database
- There are other alternatives, but the main alternatives are MySQL and Postgresql. (Although I'm an admirer of MySQL, Postgresql has the upper hand because its tables are transaction safe, and Irina is an expert on it.)
- We would like to come to some conclusion on the feasibility of switching databases and hear a report on it for the July Core Week

Conclusion

- Brian et al. will be working on the event builder this summer, and progress will be reviewed before September 1
- Multievent buffering work will proceed over the summer with the goal of starting with it in Run 4
- Work will be done to speed up the data logging as much as practical
- Replacing Objectivity with a freeware relational database will be assessed in the next month or so